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Picton High School, 480 Argyle Street, Picton
Construction Noise & Vibration Management Plan

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1 INTRODUCTION

This report presents the recommended approach for managing potential noise and vibration impacts arising from the construction activities associated with the redevelopment of Picton High School, 480 Argyle Street, Picton.

The principal objective of this study is to undertake an evaluation of works/activities to be performed during the excavation and construction of the project and forecast the potential impacts of noise and vibration. This assessment will be used to formulate and streamline effective regulation and mitigation measures.

The principal issues, which will be addressed in this report, are:

- Identification of the noise and vibration guidelines which will be applicable to this project.
- Prediction of likely noise levels impacting surrounding receiver locations.
- Formulation of a strategy for construction to comply with the standards identified in the above point.
- Establishment of direct communication networks between affected groups, principal contractor (when engagement is finalised) and Acoustic Logic Consultancy Pty Ltd.

A critical component of this report is the formulation of noise and vibration control strategies for the different excavation and construction processes. These strategies include the formulation of site management procedures, whether they can be operational or time based. A detailed noise and vibration management plan forms part of this report.

The objective of this study in all cases is to minimise noise and vibration emissions from the excavation and construction processes or to schedule works which may have a significant acoustic impact on adjoining receivers.

Provided all measures outlined in this report are fully implemented, noise and vibration impacts associated with the construction of the development site will be strictly controlled, and the impact on the surrounding environs minimised.

2 SITE DESCRIPTION / AFFECTED PROPERTIES

Picton High School, 480 Argyle Street, Picton, the subject site, is located immediately east of the Old Hume Highway (otherwise known as Argyle Street), and is bounded by residential houses and Wonga road.

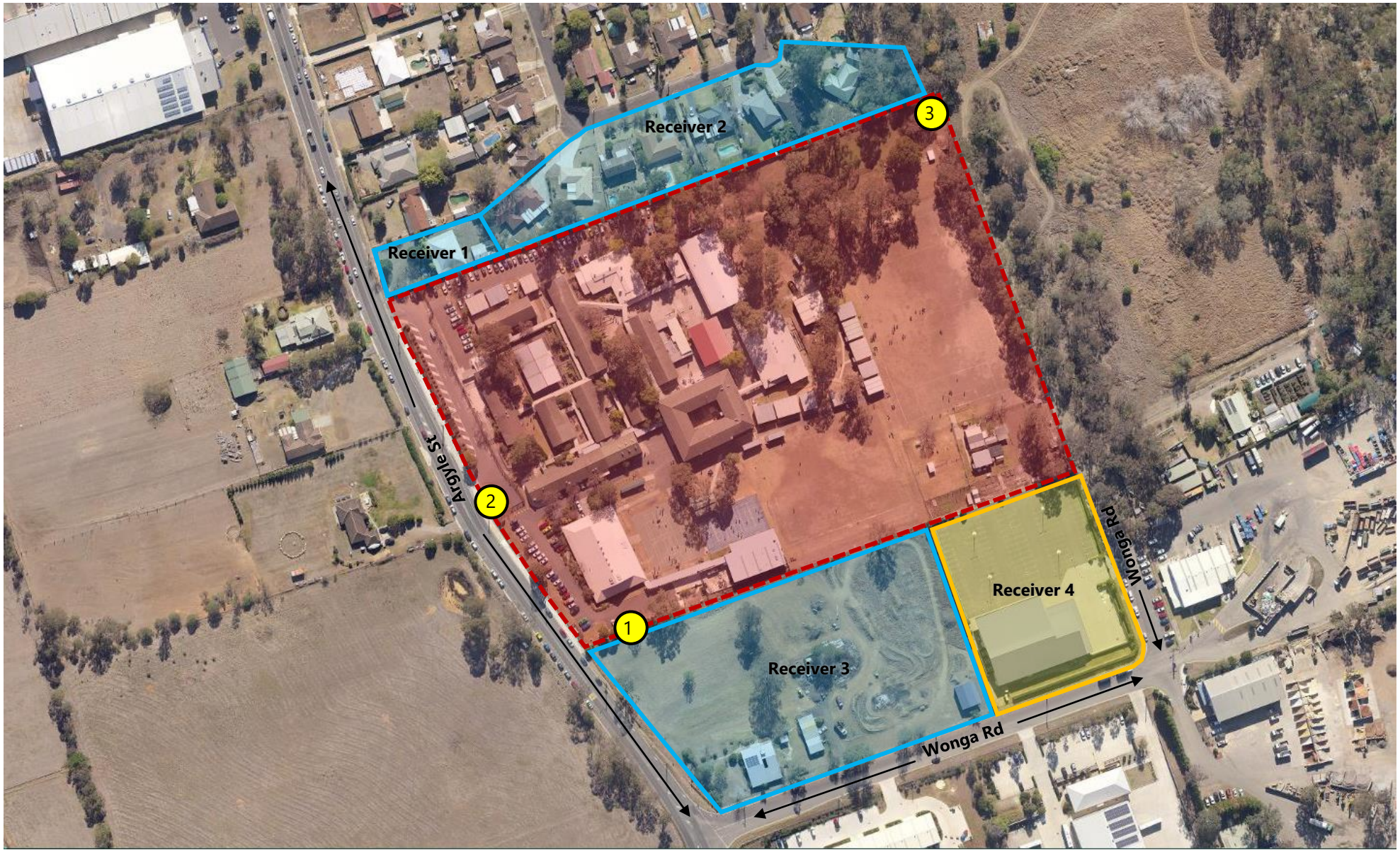
The project involves the redevelopment of the existing high school. This will include:

- Demolition of the majority of existing classrooms/offices, and construction of a large Building A and B ;
- Construction of 2 additional support unit class rooms (as extension of and existing building);
- Automotive extension of existing Metals Engineering Work Shop Building;
- Various external land scaping, and;
- The construction of additional external carparks.

Figure 1 below illustrates location of the subject site and surrounding properties. The potentially nearest affected receivers are as follows;

- **Receiver 1:** Residential house adjacent to the northern site boundary, located at 468 Argyle Street, Picton.
- **Receiver 2:** Residential houses adjacent to the northern site boundary, located at 27-41 Coachwood Crescent, Picton.
- **Receiver 3:** Residential house situated south of the project site, located at 500 Argyle Street, Picton.
- **Receiver 4:** Commercial development situated south-east of the project site, located at 15 Wonga Road, Picton.

All construction vehicles will access the site via Argyle Street. Figure 1 below illustrates the location of the subject site and unattended noise monitor location. Figure 2 illustrates the subject development.




 Unattended Noise Measurement

Figure 1 – Site Location, Receivers & Measurement Locations
Sourced from Six Maps 2019

 Project Site
 Residential Receiver
 Commercial Receiver



Figure 2 – Proposed Site Map

3 HOURS OF WORK

The Development Consent for Picton High School, 480 Argyle Street, Picton (App No. SSD 8640) states the following in regard to hours of work:

Construction Hours

C5. *Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:*

- (a) *between 7:00 am and 6:00 pm, Mondays to Fridays inclusive; and*
- (b) *between 8:00 am and 1:00 pm, Saturdays.*

No work may be carried out on Sundays or public holidays.

C6. *Activities may be undertaken outside of the hours in condition C5 if required:*

- (a) *by the Police or a public authority for the delivery of vehicles, plant or materials; or*
- (b) *in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or*
- (c) *where the works are inaudible at the nearest sensitive receivers; or*
- (d) *where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works.*

Notification of such activities must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

C7. *Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:*

- (a) *9am to 12pm, Monday to Friday;*
- (b) *2pm to 5pm Monday to Friday; and*
- (c) *9am to 12pm, Saturday.*

3.1 SUMMARY OF CONSTRUCTION HOURS

Table 1 – Summary of Construction Hours

Activity	Day	Time
Rock breaking, rock hammering, sheet piling, pile driving and similar	Monday to Friday	9:00am – 12:00pm & 2:00pm – 5:00 pm
	Saturday	No works permitted
	Sunday & Public Holidays	No works permitted
All other construction activities	Monday to Friday	7:00am – 6:00pm
	Saturday	8:00am – 1:00pm
	Sunday & Public Holidays	No works permitted

4 AMBIENT NOISE MONITORING

Background noise monitoring has been completed by our office and GHD to determine the Rating Background Noise Levels around the site. All three monitor locations have been numbered as follows:

Logger 1: ALC 2019

Logger 2: GHD 2017

Logger 3: GHD 2017

4.1 MEASUREMENT EQUIPMENT

ALC's Unattended noise monitoring was conducting using one Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of each measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

4.2 MEASUREMENT PERIOD & LOCATION

Table 2 – Unattended Rating Background Noise Monitors

Logger #	Location	Start Date	End Date
Logger 1: ALC 2019	South-west corner of site	Monday 18/02/2019	Sunday 24/02/18
Logger 2: GHD 2017	Argyle Street	Thursday 07/12/17	Friday 15/12/17
Logger 3: GHD 2017	North-east corner of site	Thursday 07/12/17	Friday 15/12/17

Refer to figure 1 for detailed logger locations

4.3 MEASURED BACKGROUND NOISE LEVELS

The background noise levels established from the unattended noise monitoring are detailed in the table below.

Table 3 – Attended Rating Background Noise Measurement

Logger #	Time Period	Rating Background noise level dB(A) $L_{90}(\text{period})$
Logger 1: ALC 2019	Daytime (7am-6pm)	48
	Evening (6pm-10pm)	41
	Night (10pm-7am)	31
Logger 2: GHD 2017	Daytime (7am-6pm)	48
	Evening (6pm-10pm)	40
	Night (10pm-7am)	28
Logger 3: GHD 2017	Daytime (7am-6pm)	39
	Evening (6pm-10pm)	35
	Night (10pm-7am)	26

5 NOISE AND VIBRATION MANAGEMENT

5.1 NOISE MANAGEMENT LEVELS

Noise impacts from the proposed construction works on site will be assessed against the following guidelines;

- Development Consent (App No. SSD 8640)
- NSW EPA Interim Construction Noise Guideline; and
- Australian Standard 2436-2010 “*Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites*”.

5.1.1 Development Consent (App No. SSD 8640)

- B18.** The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following:
- (a) be prepared by a suitably qualified and experienced noise expert;
 - (b) describe procedures for achieving the noise management levels in EPA’s Interim Construction Noise Guideline (DECC, 2009);
 - (c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;
 - (d) include strategies that have been developed with the community for managing high noise generating works;
 - (e) describe the community consultation undertaken to develop the strategies in condition B18(d); and
 - (f) include a complaints management system that would be implemented for the duration of the construction.

Construction Noise Limits

- C14.** *The development must be constructed to achieve the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the management and mitigation measures identified in the approved Construction Noise and Vibration Management Plan.*
- C15.** *The Applicant must ensure construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential precincts outside of the construction hours of work outlined under condition C5.*
- C16.** *The Applicant must implement, where practicable and without compromising the safety of construction staff or members of the public, the use audible movement alarms of a type that would minimise noise impacts on surrounding noise sensitive receivers.*
- C17.** *Any noise generated during construction of the development must not be offensive noise within the meaning of the Protection of the Environment Operations Act 1997 or exceed approved noise limits for the site.*

5.1.2 NSW EPA Interim Construction Noise Guideline

The “quantitative” assessment procedure, as outlined in the Interim Construction Noise Guideline (ICNG) will be used. The quantitative assessment method requires: Determination of noise generation goals (based on ambient noise monitoring); Prediction of operational noise levels at nearby development; and if necessary, recommendation of noise controls strategies in the event that compliance with noise emission goals is not possible.

EPA guidelines adopt differing strategies for noise control depending on the predicted noise level at the nearest residences:

- *“Noise affected” level.* Where construction noise is predicted to exceed the “noise effected” level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the “noise effected level”. For residential properties, the “noise effected” level occurs when construction noise exceeds ambient levels by more than $10\text{dB(A)}_{\text{Leq}(15\text{min})}$.
- *“Highly noise affected level”.* Where noise emissions are such that nearby properties are “highly noise effected”, noise controls such as respite periods should be considered. For residential properties, the “highly noise effected” level occurs when construction noise exceeds $75\text{dB(A)}_{\text{Leq}(15\text{min})}$ at nearby residences.

Table 4 – Noise Emission Management Levels for Residential Properties.

Reeciver	Rating Background noise level $\text{dB(A)}_{\text{L}_{90}(\text{period})}$	“Noise Affected” Level - $\text{dB(A)}_{\text{Leq}(15\text{min})}$	“Highly Noise Affected” Level - $\text{dB(A)}_{\text{Leq}(15\text{min})}$
Receiver 1	48	58	75
Receiver 2	40	50	75
Receiver 3	48	58	75

Section 4.1.2 and 4.1.3 of this guideline also nominates management levels for other sensitive land uses (other than residences). Noise levels relevant to this assessment is detailed below.

Table 5 – Noise Emission Management Levels for Non-Residential Properties

Land Use	Management Level - $\text{dB(A)}_{\text{Leq}(15\text{min})}$
Commercial, Office, Retail	External noise level $70\text{dB(A)}_{\text{Leq}(15\text{mins})}$ *

5.1.3 Australian Standard 2436-1981 “Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites”

The Australian Standard AS2436 states that where all reasonable and available measures have been taken to reduce construction noise, mitigation strategies may be put in place to reduce levels noise levels to within a reasonable and acceptable level.

For the control and regulation of noise from construction sites, AS 2436:1981 nominates the following:

- That reasonable suitable noise criterion is established,
- That all practicable measures be taken on the building site to regulate noise emissions, including the siting of noisy static processes to locations of the site where they can be shielded, selecting less noisy processes, and if required regulating construction hours, and

- c. The undertaking of noise monitoring where non-compliance occurs to assist in the management and control of noise emission from the construction site.

The guideline reflects on feasible and reasonable mitigation strategies, management controls and public liaising in the effort to reach realistic compromises between construction sites and potential noise affected receivers.

Based on this information the following procedure will be used to assess noise emissions:

- Predict noise levels produced by typical construction activities at the sensitive receivers.
- Adopt management conditions as per AS 2436 in the event of a non-compliance.

5.2 VIBRATION MANAGEMENT CRITERIA

Vibration caused by the proposed excavation or construction activities on site should be assessed using the following guidelines:

- Development Consent (App No. SSD 8640)
- For structural damage vibration, German Standard DIN 4150-3 Structural Vibration: Effects of Vibration on Structures; and
- For human exposure to vibration (amenity), the evaluation criteria presented in the NSW EPA's *Assessing Vibration: a technical guideline* document will be used to set management levels.

The criteria and the application of these standards are discussed in separate sections below.

5.2.1 Development Consent (App No. SSD 8640)

Vibration Criteria

C18. *Vibration caused by construction at any residence or structure outside the site must be limited to:*

- (a) *for structural damage, the latest version of DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures (German Institute for Standardisation, 1999); and*
- (b) *for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: a technical guideline (DEC, 2006) (as may be updated or replaced from time to time).*

C19. *Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in condition C18.*

C20. *The limits in conditions C18 and C19 apply unless otherwise outlined in a Construction Noise and Vibration Management Plan, approved as part of the CEMP required by condition B18 of this consent.*

5.2.2 Structure Borne Vibrations

German Standard DIN 4150-3 (1999-02) provides a guideline for acceptable levels of vibration velocity in building foundations, to assess the effects of vibration on structures. The table give guidance on the maximum accepted values of velocity at the foundation and in the plane of the highest floor of various types of buildings, to prevent any structural damage.

The table below lists the peak particle velocity, which is the maximum absolute value of the velocity signals for the three orthogonal components. This is measured as a maximum value of any of the three orthogonal component particle velocities when measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

Table 6 – DIN 4150-3 (1999-02) Safe Limits for Building Vibration

Type of Structure		Peak Particle Velocity (mms ⁻¹)			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

5.2.3 Assessing Amenity – Human Comfort

The NSW EPA's *Assessing Vibration – a technical guideline* is based on the guidelines contained in British Standard BS 6472-1992 'Guide to Evaluate Human Exposure to Vibration Buildings (1Hz to 80Hz'. This guideline provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings.

The recommendations of this guideline should be adopted to assess and manage vibration from the site. Where vibration exceeds, or is likely to exceed, the recommended levels then an assessment of reasonable and feasible methods for the management of vibration should be undertaken.

Table 7 – BS 6472 Vibration Criteria

		RMS acceleration (m/s ²)		RMS velocity (mm/s)		Peak velocity (mm/s)	
Place	Time	Preferred	Maximum	Preferred	Maximum	Preferred	Maximum
Continuous Vibration							
Residences	Daytime	0.01	0.02	0.2	0.4	0.28	0.56
Offices	Day or night-time	0.02	0.04	0.4	0.8	0.56	1.1
Workshops		0.04	0.08	0.8	1.6	1.1	2.2
Impulsive Vibration							
Residences	Daytime	0.3	0.6	6.0	12.0	8.6	17.0
Offices	Day or night-time	0.64	1.28	13	26	18	36
Workshops		0.64	1.23	13	26	18	36

Note 1: Continuous vibration relates to vibration that continues uninterrupted for a defined period (usually throughout the daytime or night-time), e.g. continuous construction or maintenance activity. (DECC, 2006).

Note 2: Impulsive vibration relate to vibration that builds up rapidly to a peak followed by a damped decay and that may or may not involve several cycles of vibration (depending on frequency and damping), with up to three occurrences in an assessment period, e.g. occasional loading and unloading, or dropping of heavy equipment. (DECC, 2006)

6 PROPOSED CONSTRUCTION ACTIVITIES

We have been advised of the typical equipment/processes anticipated to be used for the construction of the subject development.

The A-weighted sound power levels for the anticipated equipment/processes are outlined in the tables below.

Table 8 – Construction Activities

Equipment / Process	Sound Power Level dB(A)
Jackhammer	115*
Angle grinders	114*
Bulldozer	113
Electric Saw	111*
Vibrating Roller	110
Excavator	108
Trucks	108
Concrete Pump	107
Impact Drill	105*
Cement Mixing Truck	105
Powered Hand Tools	94*

*** - includes 5 dB(A) addition for characteristics of noise source.**

The noise levels presented in the above table are derived from the following sources:

1. On-site measurements;
2. Table D2 of Australian Standard 2436-1981 & Table A1 of Australian Standard 2436-2010; and
3. Data held by this office from other similar studies.

7 NOISE EMISSION PREDICTIONS

7.1 METHODOLOGY

Noise from the loudest typical construction activities for each stage of works have been predicted to the nearest most affected sensitive receivers. The predicted noise levels are presented in this section and are based on the areas on the site in which the plant is likely to be used.

The predictions present a range of noise levels taking into account:

- The varying distance between the noise source and the receiver depending on the location of the noise source on the site.
- The screening effect provided by any existing building structures.

It is noted that many of the noise sources are present over a small period of the day or may be present for a few days with a significant intervening period before the activity occurs again.

Table 9 – Predicted Noise from Construction Works to Receiver 1: 468 Argyle Street

Construction Plant	Plant Noise Level dB(A)	Predicted Noise Range		Noise Management Level dB(A) _{Leq(15mins)}	Management Conditions
		dB(A) _{Leq(15mins)}			
Jackhammer	115*	60	80	58	See section 8.1
Angle grinders	114*	60	80	58	
Bulldozer	113	60	79	58	
Electric Saw	111*	57	77	58	
Vibrating Roller	110	52	58	58	
Excavator	108	55	74	58	
Trucks	108	55	75	58	
Concrete Pump	107	53	75	58	
Impact Drill	105*	47	71	58	
Cement Mixing Truck	105	50	73	58	
Crane	105	53	63	58	
Powered Hand Tools	94*	35	60	58	

Table 10 – Predicted Noise from Construction Works to Receiver 2: 27-41 Coachwood Crescent

Construction Plant	Plant Noise Level dB(A)	Predicted Noise Range		Noise Management Level	Management Conditions
		dB(A) $L_{eq}(15mins)$			
Jackhammer	115*	57	70	50	See section 8.1
Angle grinders	114*	55	68	50	
Bulldozer	113	55	67	50	
Electric Saw	111*	53	65	50	
Vibrating Roller	110	52	65	50	
Excavator	108	50	62	50	
Trucks	108	52	55	50	
Concrete Pump	107	50	55	50	
Impact Drill	105*	47	60	50	
Cement Mixing Truck	105	50	53	50	
Crane	105	50	53	50	
Powered Hand Tools	94*	35	48	50	

Table 11 – Predicted Noise from Construction Works to Receiver 3: 500 Argyle Street

Construction Plant	Plant Noise Level dB(A)	Predicted Noise Range		Noise Management Level	Management Conditions
		dB(A) $L_{eq}(15mins)$			
Jackhammer	115*	60	80	58	See section 8.1
Angle grinders	114*	60	80	58	
Bulldozer	113	60	79	58	
Electric Saw	111*	57	77	58	
Vibrating Roller	110	52	58	58	
Excavator	108	55	74	58	
Trucks	108	55	75	58	
Concrete Pump	107	53	75	58	
Impact Drill	105*	47	71	58	
Cement Mixing Truck	105	50	73	58	
Crane	105	53	63	58	
Powered Hand Tools	94*	35	30	58	

Table 12 – Predicted Noise from Construction Works to Receiver 4: 15 Wonga Road

Construction Plant	Plant Noise Level dB(A)	Predicted Noise Range		Noise Management Level dB(A) $L_{eq}(15mins)$	Management Conditions
		dB(A) $L_{eq}(15mins)$			
Jackhammer	115*	57	72	70	See section 8.1
Angle grinders	114*	55	70	70	
Bulldozer	113	55	70	70	
Electric Saw	111*	53	68	70	
Vibrating Roller	110	55	67	70	
Excavator	108	50	65	70	
Trucks	108	50	54	70	
Concrete Pump	107	50	53	70	
Impact Drill	105*	47	62	70	
Cement Mixing Truck	105	47	50	70	
Crane	105	50	55	70	
Powered Hand Tools	94*	35	50	70	

8 AMELIORATIVE MEASURES

8.1 SITE SPECIFIC RECOMMENDATIONS

8.1.1 Potential Vibration and Structure Borne Noise Impacts

Vibration intrusive activities (piling or rock breaking operations) are proposed on site and hence vibration and structure borne noise impacts are expected from the construction of the subject development.

The vibrating roller can cause vibration intrusion when operating within close proximity (10m or less) of a resident. However, the proposed use of the vibrating roller does not occur close residents.

8.1.2 Excavator and Bulldozers

Excavators and bulldozers are expected to be used for the majority of the time during the demolition and excavation periods. Where prolonged use is necessary, this equipment/machinery could be moved to another part of the site to offer the receiver closest to the plant some respite. Management processes include;

- We recommend commencing all noisy excavation works within 40-meters of an residential property boundary on site only after 8am, providing a 1-hour respite period during the morning period from the 7am standard hours of construction.
- All surrounding receivers will be notified of the duration and extent of the works proposed during the excavation stage via letterbox drops, with a detailed engagement plan and contact information for all relevant personnel on site.
We Note: SINSW have a Community Liaison Team especially dedicated to addressing complaints and notifying receivers.

8.1.3 Jackhammers, Angle Grinders, Electric Saws

Hammering will typically produce the loudest noise levels emanating from the site and have the highest potential for noise impacts on surrounding receivers. Hand tools would only be typically used sporadically. However, where extended use of these items would occur noise emissions should be managed. Management processes will include:

- Notification of potentially affected receivers of the duration and extent of the works proposed via letterbox drops, with a detailed engagement plan and contact information for all relevant personnel on site.
- We recommend commencing all works involving the use of jackhammers, electric saw and angle grinders within 40-meters of an residential property boundary on site only after 8am, providing a 1-hour respite period during the morning period from the 7am standard hours of construction.

8.1.4 Vehicle Noise and Concrete Pumps

All construction traffic, including loading and unloading operations are proposed to occur via an access gate via Argyle Street. We recommend the following controls:

- Trucks and bobcats to use a non-tonal reversing beacon (subject to OH&S requirements) to minimise potential disturbance of neighbours.
- Avoid careless dropping of construction materials into empty trucks.
- Trucks and concrete trucks must turn off their engines when on site to reduce impacts on adjacent land use (unless truck engine needs to remain on, for example during concrete pumping).

- Where concrete pumps are located unscreened and within 40m of a residence, pumping should not commence prior to 8am.

8.1.5 Onsite Temporary Class Rooms

The noise management level for a classroom in the ICNG is 45dB(A).

The Interim Construction Noise Guidelines do not require strict compliance with a Noise Management Level. They require that reasonable and feasible noise mitigation strategies be implemented in the event that the levels are expected to be exceeded.

We note that the most noise intensive demolition activity at the site is complete (demolition of concrete floor slabs using hydraulic hammer). This equipment item would produce intermittent noise levels of up to 65dB(A) within the class room.

Remaining activities are expected to be much quieter (typically 10-15dBA) quieter than the hydraulic hammer). Despite this, intermittent exceedances of the 45dB(A) Noise Management Level would still be likely, depending on how close to the classroom the activities are conducted.

In light of the above, we recommend:

- Activities such as use of concrete vibrators and helicopter floats (on days of slab pours) or ground compaction works would have the greatest chance of noise compliant.
- We recommend that timing of these works be discussed with the school to avoid being conducted on days of exams or other highly noise sensitive activities.
- If there are high noise generator activities proposed for extended periods, installing screening or Perspex lining over classroom windows facing the work site may be considered.

8.1.6 Other Activities

- In the event of complaint, noise management techniques identified in this report should be employed to minimise the level of noise impact. This may include community consultation and scheduling of loud construction processes.

We Note: SINSW have a Community Liaison Team especially dedicated to addressing complaints and notifying receivers.

- Notwithstanding above, general management techniques and acoustic treatments are included below which may be implemented on a case-by-case basis to reduce noise emissions to surrounding receivers.

9 CONTROL OF CONSTRUCTION NOISE AND VIBRATION

The execution of this work will facilitate the formulation of noise control strategies for this project.

The flow chart presented in Figure 4 illustrates the process that will be followed in assessing construction activities.

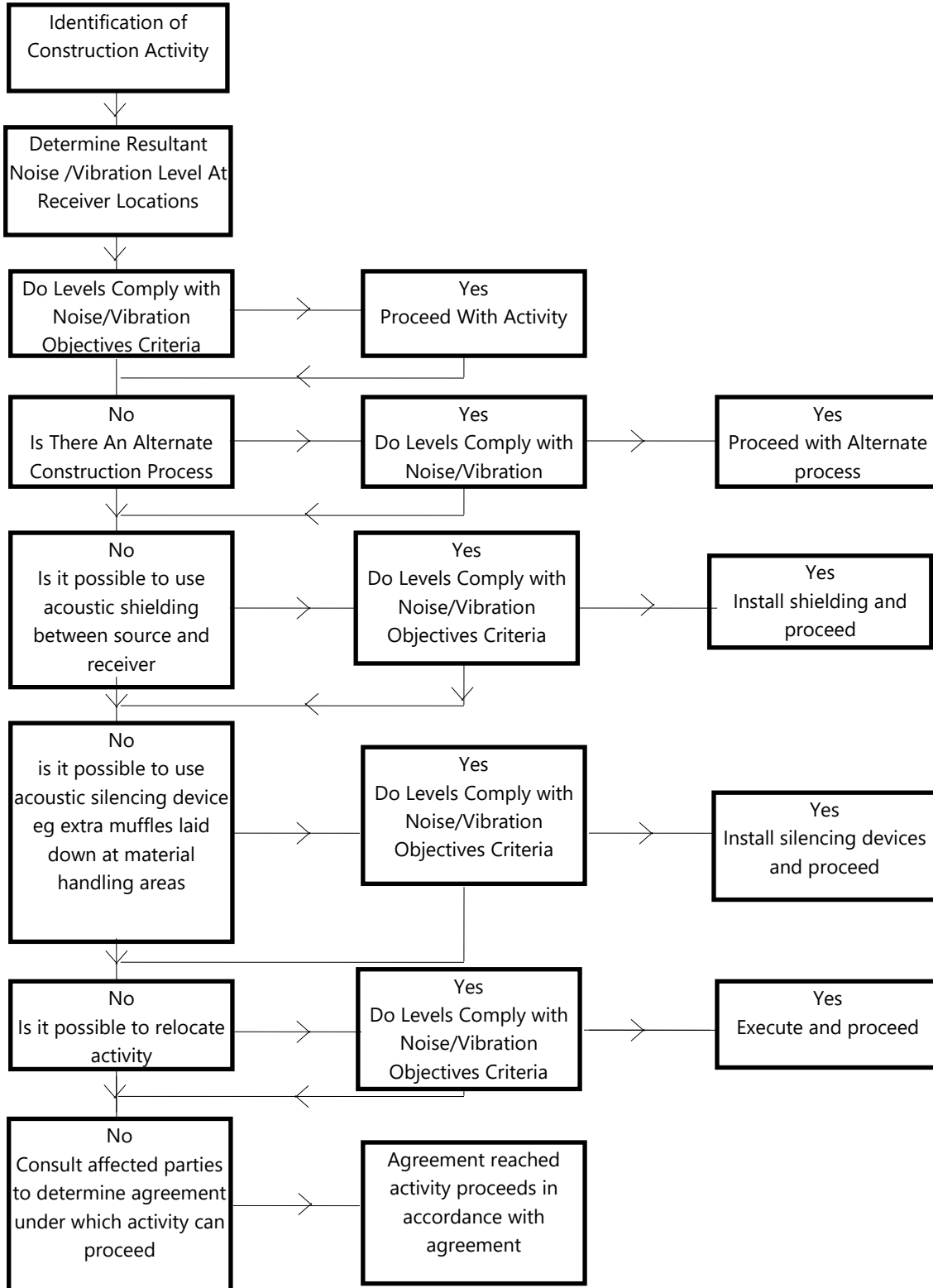


Figure 3 – Process Flowchart

10 NOISE AND VIBRATION CONTROL METHODS

The determination of appropriate noise control measures will be dependent on the particular activities and construction appliances. This section provides an outline of available methods.

10.1 SELECTION OF ALTERNATE APPLIANCE OR PROCESS

Where a particular activity or construction appliance is found to generate excessive noise levels, it may be possible to select an alternative approach or appliance. For example; the use of a hydraulic hammer on certain areas of the site may potentially generate high levels of noise. By carrying this activity by use of pneumatic hammers, bulldozers ripping and/or milling machines lower levels of noise will result.

Selection of alternative appliances have been explored for the demolition of the existing structure. Due to safety concerns, particularly in relation to slab and structural loading, large excavator mounted milling will not be feasible.

Pre-drilling, saw cutting and ripping may be incorporated in the excavation of the existing base slab. Whilst hammering may still be required, the substitution of drilling, sawing and ripping will reduce degree of hammering required.

10.2 ACOUSTIC BARRIER

Barriers or screens can be an effective means of reducing noise. Barriers can be located either at the source or receiver.

- The placement of barriers at the source is generally only effective for static plant (tower cranes). Equipment which is on the move or working in rough or undulating terrain cannot be effectively attenuated by placing barriers at the source.
- Barriers can also be placed between the source and the receiver however this will not be beneficial in this instance due to receivers overlooking the site.

The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source, reductions of up to 15dB(A) can be expected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8dB(A) may be achieved. Where no line of sight is obstructed by the barrier, generally no noise reduction will occur.

As barriers are used to provide shielding and do not act as an enclosure, the material they are constructed from should have a noise reduction performance that is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 10mm or 15mm thick plywood (radiata plywood) would be acceptable for the barriers.

10.3 SILENCING DEVICES

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

10.4 MATERIAL HANDLING

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

10.5 TREATMENT OF SPECIFIC EQUIPMENT

In certain cases, it may be possible to specially treat a piece of equipment to dramatically reduce the sound levels emitted.

10.6 ESTABLISHMENT OF SITE PRACTICES

This involves the formulation of work practices to reduce noise generation. It is recommended that all available and reasonable treatments and mitigation strategies presented in this report be adopted to minimise noise emissions from the excavation and construction activities on site.

10.7 COMBINATION OF METHODS

In some cases, it may be necessary that two or more control measures be implemented to minimise noise.

10.8 MAINTENANCE OF PLANT, EQUIPMENT AND MACHINERY

Construction Profile will ensure all plant, equipment and machinery are regularly serviced and maintained at optimum operating conditions, to ensure excessive noise emissions are not generated from faulty, overused or unmaintained machinery.

10.9 STAFF TRAINING AND REPORTING MECHANISM

All construction staff on site, as part of the site induction process, will be informed of the surrounding sensitive receivers on site and the site specific recommendations to reduce noise impacts to these receivers (late starts, respite period, vehicle noise control etc. – refer section 8).

Any complaints received by construction staff must be immediately reported to the site foreman, followed by completion of incident report form and steps detailed in section 11.3 below.

A copy of the recommendations detailed in this report (section 8) and dealing with complaints procedure (section 11.2) will be posted at key areas around the site for easy reference by all staff.

11 COMMUNITY INTERACTION AND COMPLAINTS HANDLING

11.1 ESTABLISHMENT OF DIRECT COMMUNICATION WITH AFFECTED PARTIES

In order for any construction noise management programme to work effectively, continuous communication is required between all parties, which may be potentially impacted upon, the builder and the regulatory authority. This establishes a dynamic response process which allows for the adjustment of control methods and criteria for the benefit of all parties.

The objective in undertaking a consultation processes is to:

- Inform and educate the groups about the project and the noise controls being implemented;
- Increase understanding of all acoustic issues related to the project and options available;
- Identify group concerns generated by the project, so that they can be addressed; and
- Ensure that concerned individuals or groups are aware of and have access to a Constructions Complaints Register which will be used to address any construction noise related problems should they arise.

Community consultation is recommended immediately (as works have already commenced on site), with letterbox notifications to all identified surrounding sensitive receivers (refer section 2). This will include a construction management plan detailing the proposed works on site and duration of each stage.

11.2 DEALING WITH COMPLAINTS

Should ongoing complaints of excessive noise or vibration criteria occur immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration limits all work potentially producing vibration shall cease until the exceedance is investigated.

The effectiveness of any changes shall be verified before continuing. Documentation and training of site staff shall occur to ensure the practices that produced the exceedances are not repeated.

If a noise complaint is received the complaint should be recorded on a Noise Complaint Form. The Site Manager must complete the Noise Complaint Form and is responsible for investigating and maintaining the register of complaints. The complaint form should list:

- The name and address of the complainant (if provided);
- The time and date the complaint was received;
- The nature of the complaint and the time and date the noise was heard;
- The name of the employee who received the complaint;
- Actions taken to investigate the complaint, and a summary of the results of the investigation;
- Required remedial action, if required;
- Validation of the remedial action; and
- Summary of feedback to the complainant.

A permanent register of complaints should be held. All complaints received should be fully investigated and reported to management. The complainant should also be notified of the results and actions arising from the investigation.

The investigation of a complaint shall involve where applicable;

- Noise measurements at the affected receiver;
- An investigation of the activities occurring at the time of the incident;
- Inspection of the activity to determine whether any undue noise is being emitted by equipment; and
- Whether work practices were being carried out either within established guidelines or outside these guidelines.

Where an item of plant is found to be emitting excessive noise, the cause is to be rectified as soon as possible. Where work practices within established guidelines are found to result in excessive noise being generated then the guidelines should be modified so as to reduce noise emissions to acceptable levels. Where guidelines are not being followed, the additional training and counselling of employees should be carried out.

Measurement or other methods shall validate the results of any corrective actions arising from a complaint where applicable.

11.3 REPORTING REQUIREMENTS

The following shall be kept on site:

1. A register of complaints received/communication with the local community shall be maintained and kept on site.
2. Where noise/vibration complaints require noise/vibration monitoring, results from monitoring shall be retained on site at all times.
3. Any noise exceedances occurring including, the actions taken and results of follow up monitoring.
4. A report detailing complaints received and actions taken shall be presented to the construction liaison committee.

11.4 CONTINGENCY PLANS

Where non-compliances or noise complaints are raised, the following methodology will be implemented:

1. Determine the offending plant/equipment/process.
2. Locate the plant/equipment/process further away from the affected receiver(s) if possible.
3. Implement additional acoustic treatment in the form of localised barriers, silencers etc. where practical.
4. Selecting alternative equipment/processes where practical.

12 CONCLUSION

This report presents an assessment of potential noise and vibration impacts associated with the excavation and construction activities proposed as part of the redevelopment of Picton Highschool.

Noise emission predictions to the surrounding sensitive receivers have been detailed in Section 7 and ameliorative treatments to reduce noise impacts are detailed in Section 8.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Jenna MacDonald', with a stylized flourish extending to the right.

Acoustic Logic Consultancy Pty Ltd
Jenna MacDonald